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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BOOKER, KELVIN E	

ART UNIT	PAPER NUMBER
2121	19

DATE MAILED: 10/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/404,940	TOYAMA, KENTARO	
	Examiner	Art Unit	
	Kelvin E Booker	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *2,3 and 30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Office Action* .

DETAILED ACTION

Response to Amendment

1. In the After-Final Amendment "C", filed October 10, 2003 (see paper no. 18), claim 30 has been canceled and claim 31 has been amended to depend upon claim one. Claims 1, 4-29 and 31 are presented for further consideration.

Allowable Subject Matter

2. The indicated allowability of claims 1, and 4-29 is withdrawn in view of the newly discovered reference to Yasuda et al., "Application of Neural Network to Aesthetic Design of Bridges". Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1, 4-29 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jagielski, "An Application of Neural Networks to Emulation of Aesthetic Judgments" [hereafter Jagielski] in view of Yasuda et al., "Application of Neural Network to Aesthetic Design of Bridges" [hereafter Yasuda].

As per claim 1, Jagielski teaches of a computer-implemented method comprising: (A) inputting a training set including a plurality of images and a corresponding plurality of aesthetic scores for the images (see Abstract; and page 336, column 1: inputting images and corresponding aesthetic values); (B) training a classifier to provide aesthetic scores based on the training set (see page 336, columns 1 and 2: training the classifier); and (C) generating an aesthetic score for the image based on the classifier (see page 336, columns 1 and 2: training the classifier and generating a score). Although Jagielski clearly teaches of using back-propagation in order to fine-tune the disclosed neural network for several test cases (see page 336, column 2, paragraph four through page 337, column one, paragraph one; and Tab 2 on page 337), the art fails to explicitly disclose the generation of a recommendation to improve the aesthetic score.

However, Yasuda teaches of generating a recommendation to improve an aesthetic score for the image by evaluating the end results and compiling a recommendation that can be applied to a design to improve the project (see sections 5-6 on pages 540-541, especially section 6 on page 541).

It would have been obvious to one of ordinary skill in the art, at the time of the applicant's invention, to combine Jagielski's method of generating an aesthetic score for input images based on a trained neural network, with Yasuda's method of generating a recommendation based upon results from the network, in order to provide a method for presenting to the user and/or designer, a recommendation as to some of the aesthetic options, which when applied to an image/project, will provide greater aesthetic value. Merging the two methods also provides the user and/or designer the flexibility of either adding or deleting determined options to better refine an image/project.

As per claim 4, Jagielski teaches of generating aesthetic scores (see claim one above), but fails to explicitly disclose generating recommendations by employing a *gradient ascent*.

However, Yasuda teaches of generating a recommendation that comprises the use of a *gradient ascent* during the system configuration by the neural network (see section 4.1 on page 537: quantifying the multiple inputs into the neural network in order to facilitate rule generation for the resultant recommendation).

It would have been obvious to one of ordinary skill in the art, at the time of the applicant's invention, to combine Jagielski's method of generating aesthetic scores with Yasuda's method of employing a *gradient ascent* in order to provide a method for quantifying objective and subjective (e.g., qualitative and quantitative) input values, and generating a quantitative value in order to provide a numerical basis for the neural network to operate.

As per claim 5, Jagielski teaches of generating aesthetic scores (see claim one above), but fails to explicitly disclose generating recommendations via local searches.

However, Yasuda teaches of generating a recommendation comprising of performing a local search (see section 3 on page 535; and tables 1-3 on page 536: searching and employing aesthetic parameters along with local images).

It would have been obvious to one of ordinary skill in the art, at the time of the applicant's invention, to combine Jagielski's method of generating aesthetic scores with Yasuda's method of performing local searches in order to provide a more efficient [via both cost and resource usage] method of gathering information relative to a project, and forming a basis for generating the resulting recommendation.

As per claim 6, Jagielski teaches of a method wherein training a classifier comprises training one of a Bayesian classifier, a Support Vector Machine (SVM) classifier, a neural net classifier, and a decision tree classifier (see Abstract; and page 336, column 1: employing a neural network for training purposes).

As per claim 7, Jagielski teaches of a method wherein training a classifier comprises utilizing feature selection to correlate at least one image feature of the images with their corresponding aesthetic scores (see page 335, column 1: using aesthetic descriptors and preferences).

As per claim 8, Jagielski teaches of a method wherein utilizing feature selection to correlate at least one image feature comprises utilizing feature selection to correlate at least one image feature selected from the group essentially consisting of: color presence, color distribution, geometrical quantities of segmented image parts, coefficients of image transformations, and higher-level image representations (see page 335, column 1: using aesthetic descriptors and preferences).

As per claim 9, Jagielski teaches of a computer-implemented method comprising: (A) inputting an image (page 336, column 1); and (B) generating an aesthetic score for the image by utilizing a classifier previously trained on a training set including a plurality of images and a corresponding plurality of aesthetic scores for the images (see page 336, columns 1 and 2).

Although Jagielski clearly teaches of using back-propagation in order to fine-tune the disclosed neural network for several test cases (see page 336, column 2, paragraph four through page 337, column one, paragraph one; and Tab 2 on page 337), the reference fails to explicitly disclose the generation of a recommendation to improve the aesthetic score.

However, Yasuda teaches of generating a recommendation to improve an aesthetic score for the image by evaluating the end results and compiling a recommendation that can be applied to a design to improve the project (see sections 5-6 on pages 540-541, especially section 6 on page 541).

It would have been obvious to one of ordinary skill in the art, at the time of the applicant's invention, to combine Jagielski's method of generating an aesthetic score for input images based on a trained neural network, with Yasuda's method of generating a recommendation based upon results from the network, in order to provide a method for presenting to the user and/or designer, a recommendation as to some of the aesthetic options, which when applied to an image/project, will provide greater aesthetic value, while also presenting to the user and/or designer the flexibility to either add or delete aforementioned options.

As per claim 10, Jagielski teaches of a method wherein generating an aesthetic score comprises generating an aesthetic score based on at least one image feature of the image (see page 335, column 1).

As per claim 11, Jagielski teaches of a method wherein generating an aesthetic score based on at least one image feature of the image comprises generating an aesthetic score based on at least one image feature selected from the group essentially consisting of: color presence, color distribution, geometrical quantities of segmented image parts, coefficients of image transformations, and higher-level image representations (see page 335, column 1).

As per claim 12, Jagielski teaches of a method wherein utilizing a classifier comprises utilizing one of a Bayesian classifier, a Support Vector Machine (SVM) classifier, a neural net classifier, and a decision tree classifier (Abstract; and page 336, column 1).

As per claims 13-18, the same limitations are subjected to in claims 1 and 4-8, therefore the same rejections apply (see claims 1, and 4-8 above).

As per claim 19, the same limitations are subjected to in claim 1, therefore the same rejections apply (see claim 1 above).

As per claims 20-21, the same limitations are subjected to in claims 6-7, respectively, therefore the same rejections apply (see claims 6-7 above).

As per claims 22-23, the same limitations are subjected to in claims 9-10, respectively, therefore the same rejections apply (see claims 9-10 above).

As per claim 24, the same limitations are subjected to in claim 12, therefore the same rejections apply (see claims 12 above).

As per claims 25-27, the same limitations are subjected to in claims 1, 4 and 5, respectively, therefore the same rejections apply (see claims 1, 4 and 5 above).

As per claims 28 and 29, the same limitations are subjected to in claims 16 and 18, respectively, therefore the same rejections apply (see claims 16 and 18 above).

As per claim 30, Jagielski teaches of generating aesthetic scores (see claim one above), but fails to explicitly disclose generating recommendations based on manipulating visual elements in the image.

However, Yasuda teaches of generating recommendations on how to improve the aesthetic score by manipulating visual elements/characteristics in an image (see sections 5-6 on pages 540-541, especially section six on page 541).

It would have been obvious to one of ordinary skill in the art, at the time of the applicant's invention, to combine Jagielski's method of generating an aesthetic score for input images based on a trained neural network, with Yasuda's method of generating a recommendation based upon manipulating visual elements in an image, in order to provide a method for presenting to the user and/or designer, a recommendation as to some of the aesthetic options, which when applied to a project, will provide greater aesthetic value.

Conclusion

5. The following is prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

A. Laaksonen et al., "PicSOM: Self-Organizing Maps for Content-Based Image Retrieval";

B. Parisi et al., "Car Plate Recognition by Neural Networks and Image Processing";

C. Wong et al., "A Two-Level Model-Based Object Recognition Technique";

D. Alwis et al., "Searching Image Databases Containing Trademarks"; and

E. Machado et al., "Generation and Evaluation of Artworks".

6. An inquiry concerning this communication or earlier communications from the examiner should be directed to Kelvin Booker whose telephone number is (703) 308-4088. The examiner can normally be reached on Monday-Friday from 7:00 AM-5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anil Khatri, can be reached on (703) 305-0282. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

An inquiry of a general nature or relating to the status of this application proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

K.E.B.

Art Unit 2121

October 20, 2003